

REQUEST FOR RECONSIDERATION

Claims 1-6 and 8-20 remain active in this application.

The claimed invention is directed to a process for the preparation of dendritic or hyperbranched polyurethanes, dendritic or hyperbranched polyurethanes and methods for producing reaction products of dendritic or hyperbranched polyurethanes.

Dendritic or hyperbranched polyurethanes have found industrial applicability but have suffered from costly and complex preparation techniques. Simpler and less costly techniques are sought.

The claimed invention addresses this problem by providing a method for preparing dendritic or hyperbranched polyurethanes by reacting diols or polyols having 1) at least one tertiary nitrogen atom; and 2) at least two hydroxyl groups, **having differing reactivity** toward isocyanate groups, with diisocyanates or polyisocyanates. Applicants have discovered that reaction of diols or polyols having at least one tertiary nitrogen atom and at least two hydroxyl groups, **having differing reactivity** toward isocyanate groups to provide a simple method for the preparation of dendritic or hyperbranched polyurethanes. Such a process and dendritic or hyperbranched polyurethane are nowhere disclosed or suggested in the cited reference of record.

The rejection of claims 1-20 under 35 U.S.C. §103(a) over Perez et al U.S. 4,786,682 in view of Bruchmann et al U.S. 6,376,637 is respectfully traversed.

None of the cited references disclose or suggest a diol or polyol having at least one tertiary nitrogen atom and at least two hydroxyl groups **of differing reactivity** towards isocyanate groups.

Perez et al merely describes a Michael addition product formed by reacting one or more primary and/or secondary amino groups with a material containing at least two α,β -ethylenically unsaturated moieties wherein the addition product contains hydroxyl

functionalities (column 2, lines 11-23). The official action recognizes the failure of the reference to describe the reactivity of the Michael addition products (page 3 of official action) but asserts that since the components are the same, the physical properties i.e. hydroxyl reactivity would be implicitly be the same.

Applicants note that the reference fails to suggest having hydroxyl groups of differing reactivity in the same compound. Typically differences in reactivity will arise from differences in substitution, a primary alcohol being more reactive than a secondary alcohol, being more reactive than a tertiary alcohol. Accordingly, while the reference allows for at least two alcohols, there is no suggestion that at least two hydroxyl groups have differing reactivity.

Moreover, there is strong evidence that the hydroxyl groups of the reference be only primary alcohols, and therefore of the **same reactivity**. Column 8, lines 41-50 identifies primary hydroxyl groups as providing an increased reactivity of the adduct while secondary hydroxyl groups exhibit slower cure responses.

The examples demonstrate a preference for only hydroxyl groups since examples 1-11 all demonstrate using only primary alcohol wherein comparative examples A and B use only a secondary alcohol. Thus, the preference for only primary hydroxyl groups is clear.

Thus, the art demonstrates a preference for primary alcohol over secondary alcohol and in no way suggest the presence of alcohols having different reactivity, in the same compound.

In contrast, the claimed invention is directed to a process in which diols or polyols having at least one tertiary nitrogen atom and at least two hydroxyl groups **having differing reactivity** toward isocyanate groups are reacted. As the reference fails to suggest having differing reactivity in the same compound and identifies a preference for primary alcohol over secondary alcohol, there would have been no motivation to provide a compound having

both primary and secondary alcohol. The demonstration of inferior reactivity for the secondary alcohol would preclude motivation to couple a secondary alcohol with a primary alcohol. Accordingly, the claimed invention would not have been obvious.

Further, the reference does not even ensure the presence of a tertiary nitrogen group.

As identified earlier, the Michael addition product is obtained by reacting one or more primary and/or secondary amino groups. Reaction of primary amino groups would not give rise to a tertiary nitrogen group, but rather only a secondary nitrogen group. Thus, there is no emphasis to provide the claim limitations of 1) a tertiary nitrogen group with 2) at least two hydroxyl groups having different reactivity.

As to Bruchmann, even though claim 4 describes a compound having at least one primary alcohol and at least one secondary alcohol, there is no suggestion of such a differing reactivity in a compound having at least one tertiary nitrogen.

Even further, there would have been no motivation to combine the teachings of the two references.


Perez fails to describe dendrimeric or hyperbranched polyurethanes, as claimed and therefore there would have been no motivation to modify in order to provide dendrimeric or hyperbranched polyurethanes. Secondly, taking the isocyanate reactive compounds of Bruchmann would mean selecting compounds as exemplified in the examples which do not contain hydroxyl groups of differing reactivity and combining them with isocyanates of Bruchmann. The result would not be a teaching of the claimed invention, because the combined disclosure would not comprise molecules with hydroxyl groups of different reactivity.

In view of the deficiencies of the disclosure of the cited art, the claimed invention would not have been obvious and withdrawal of the rejection under 35 U.S.C. §103(a) is respectfully requested.

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Richard L. Chinn, Ph.D.
Attorney of Record
Registration No. 34,305

Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/07)